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ABSTRACT

Ineffective teaching strategies plague teachers of learning disabled (LD) students just as ineffective learning strategies interfere with the performance of LD students. As a remediation for ineffective teaching, or dyspedagogia, the paper suggests the use of the LOAD procedure. LOAD is an acronym for the terms of Learning, Operation, Application, and Data Management which provide a systematic framework for teaching students with learning problems. A parallel is drawn between the role of the teacher of LD students and that of a computer programmer in that both must carefully follow predetermined steps in order to reach their goal. Examples of each step in the procedure are offered. (Author/CL)

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Remediating Dyspedagogia: Adapting Materials and Strategies to Learners' Needs

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Remediating Dyspedagogia

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Abstract

Ineffective teaching strategies plague teachers of learning disabled students just as ineffective learning strategies interfere with the performance of LD students. AS a remediation for ineffective teaching, or dyspedagogia, this paper suggests the use of the LOAD procedure. LOAD is an acronym for the steps of Learning, Operation, Application, and Data Management which provide a systematic framework for teaching students with learning problems. A parallel is drawn between the role of the LD teacher and that of a computer programmer in that both must carefully follow predetermined steps in order to reach their goal.

Many teachers of learning disabled students face the same problem their students do: difficulty in using a systematic strategy to handle complex tasks. In the case of the LD students, they have been characterized as passive learners who do not actively employ efficient learning strategies. The LD student may be overwhelmed by the demands of the classroom and make impulsive responses which make the student appear to be more handicaped than he/she is. The teacher of LD students, on the other hand, may be overwhelmed by so many classroom variables that his/her teaching becomes a response to the demands of the moment, rather than a systematically applied strategy.

This paper outlines the LOAD procedure, a systematic approach for teaching learning disabled students designed to remediate ineffective teaching, i.e., dyspedagogia. The LOAD procedure has a number of parallels with programming and using a microcomputer. LOAD is a command in the computer langauge BASIC for the procedure of moving a program from external storage into the computer's internal (or working) memory. LOAD, in this article, is an acronym which stands for Learning, Operation,

Application and Data management. The Learning phase consists of steps that are similar to programming a computer in that the teacher carefully follows procedures that will assist the LD student to respond with the correct answer. In the Operation phase the teacher helps the learning disabled student to work efficiently. The Application phase is designed to provide the appropriate amount of practice and drill for the learning disabled student to master the content or a new skill. Data management, the final phase, involves the teacher arranging the work for the student and evaluating the results of the student's work so that the student will be as efficient as possible. Programming for a learning disabled student using the LOAD procedure and programming a microcomputer both require the parallel elements of following certain principles in order to maximize efficiency, placing responsibility for success or failure on the teacher/programmer, requiring several stages of preparation before learning/processing occurs and having an eventual goal of accurately processing information.

Before a teacher of learning disabled students would use the LOAD procedure it is necessary for the teacher, just as the computer programmer, to consider how the physical characteristics of the learner/computer would affect programming procedures. The teacher must accept the physical reality of differences between students regarding such factors as memory capacity, speed of processing and the compatibility of the learner's characteristics with task demands.

Programming using LOAD

The teacher who uses the LOAD procedure systematically moves through the Learning, Operation, Application and Data management phases. In each phase, the teacher and learning disabled student work together cooperatively, although the ultimate responsibility for progress rests with the teacher.

Learning

The teacher's role in the Learning phase is similar to the role of a computer programmer in that both carefully arrange the steps needed for processing information. The Learning phase of LOAD corresponds to the acquisition level of instruction

in that the goal is to increase the accuracy of the student's performance. The procedures used in the Learning phase involve an intensive interaction between the teacher and student in order to move the student to a higher level of accuracy and to prevent errors. These procedures combine adjusting the demands of the task to match the student's abilities with helping the student to develop new responses. The steps used in the Learning stage of LOAD are summarized in the letters IEP. In this case, however, I,E, and P do not stand for Individualized Education Program but for Individualizing, Entering factors and Programming.

Individualizing instruction. The Individualizing step focuses on personalizing the teaching process for the student. The purpose of this step is to maximize student involvement and to increase the amount of responsibility the student takes in his/her instruction. The teacher and student are to be made partners in the instructional process rather than the teacher being the all- powerful dispenser of knowledge and reinforcement and the student being the passive receptical into which the skills/knowledge

are poured. Many of the problems of "learned helplessness" among learning disabled students which result from an over-dependence of the student on significant adult figures (parents and teachers) to provide for the student's needs are reduced by utilizing a shared responsibility for classroom progress.

Individualizing instruction may occur in several forms and will vary with the amount of responsibility that a student is able to handle. For older students, the student may be included in the IEP meeting with parents and teachers and be asked to provide information and share responsibility regarding the goals and objectives of the Individual Educational Program. Many LD students are capable of sharing the daily responsibility of setting instructional targets. A student's goal and subsequent commitment to spell five out of five spelling words correctly or to learn ten new sight words this week is certainly preferable to having only the teacher aware of and committed to that goal. The process of instructional goal setting can be done either through formal contracting or through

informal negotiating. Whether goal setting is done by both the teacher and student or by the teacher alone, it is necessary within The Individualizing step to constantly remind the student of the goal and the purpose of the lesson. Although this principle is deceptively simple, teachers all too often forget to make certain that the student understands exactly what is to be done and why. The LD student, for example, needs to know that the purpose of learning how to break a word into syllables is to be able to read unfamiliar words, before the student can effectively master the skills.

Finally, Individualizing the instruction means trying to match the learning style of the LD student with the manner in which the lesson is presented. Traditionally, this might have meant adjusting to the length of attention span and matching the modality of input with the student's learning style, e.g., visual methods for visual learners and auditory methods for auditory learners. Today, the adjustments for style of learning would more typically use classroom error patterns to determine if a student might be overly relying on sound characteristics when spelling

irregular words, using a defective algorithm in arithmetic, failing to use context cues in reading, not pausing for punctuation when reading or any of a variety of other indicator which would dictate a need for Individualized instruction. As with the other factors for Individualizing instruction, the student is asked whenever possible to provide information about what works best for him/her. Having the LD student described the steps that were followed when solving arithmetic problems or verbally summarizing what has been read or even to evaluate for the teacher which activities seemed to help in remembering the weekly spelling words are activities that involve the LD student in the task and promote sharing the responsibility for the student's progress between the teacher and the student.

Entering Factors. The second step in the Learning phase of the LOAD procedure considers Entering factors. The Entering factors examine the task elements that must be adjusted in order for the LD student to master a new skills or knowledge. Entering factors include three aspects of the task: input, language, and response factors.

Input factors consists of the tradition stimulus hierarchy of concrete or real world level stimuli, representational or pictorial level stimuli, and symbolic or language level stimuli. The hierarchy is illustrated by the teacher who moves from counting the blocks in two sets as a preaddition skill (a concrete task), to combining two sets of blocks shown in a picture (a representational task), to finally having students dealing with the symbolic task of adding the numerals 2 + 3. Using the picture cards in a language development kit to promote spoken language, having students draw a picture of an arithmetic word problem and using the Language Experience Approach in reading so that the student's reading stories are based on his/her actual experiences are other examples of how teachers move between the concrete, representational and symbolic levels of stimuli in order to make a task appropriate for a student. The symbolic, or language level is discussed in greater detail below.

The language level of a task is the second Entering factor. Language or symbolic tasks are most easily understood as presented in the hierarchy of

language. The hierarchy indicates that after the development of inner language, language proceeds to auditory reception (listening) and auditory expression (speaking) to visual reception (reading) and visual expression (written language). The progression of language from listen to speaking then reading to written language reminds the teacher of LD students that input preceeds output and the basis for reading and writing is the language that is heard and spoken.

Responses, the final Entering factor, may be classed as recognition, recall and reconstruction. Recognition responses are multiple choice or choosing responses in which the student identifies the correct answer. In a recall response the student is asked to remember and say the correct answer. The reconstruction response requires the student to generate the response by writing it from memory. A teacher would vary the difficulty of the respons by moving a student from the task of "find the word these" (a recognition response), to "read this word" (a recall responses), to finally "write the word these" (a reconstruction response). Another

example would be "point to the numeral 3" (recognition), "what numeral is this? (recall), and "write the numeral 3" (reconstruction). The sequence of recognition, recall and reconstruction type responses has many applications, and a teacher's ability to move from one level of response to another is a critical part of sequencing instructional tasks.

Programming. Programming is the final step in the Learning phase of the LOAD procedure. Programming considerations require the teacher of LD students to systematically cycle through a series of presentation levels including physical guidance, modeling, prompting, cueing and telling and writing, depending on the needs of the student. The physical guidance level is used for students who need the most assistance. At the physical guidance level the teacher will actually lead or guide the student through the appropriate responses. An example of this would be for the teacher to take the student's hand and guide it through the formation of the letter "M". The second most basic level of programming is modeling. In modeling the teacher demonstrates the appropriate response, the student observes the

teacher and then repeats the response. The teacher may, for example, demonstrate the correct reading of a paragraph from the reading lesson and then ask the student to read the paragraph. At the prompting level the teacher begins to form the response and the student would complete the response. The teacher might, for example, say "re" and the student response "receive" when decoding an unknown word. Programming at the cueing level has the teacher provide highlighted stimuli in order to help the student make the correct response. The teacher might, for example, color cue the silent letter "t" in the word "listen" in order to draw the student's attention to this frequently missed letter in a spelling lesson. Another form of cueing is the use of mediators. The student who remembers ROY G BLV as a cue to the names of the colors of the specturm (Red, Orange, Yellow, Green, Blue, Indigo, and Violet) or Dumb Marvin Sinks Cannon Balls as the steps to follow in the division algorithm (Divide, Multiply, Subtract, Check and Bring down) is using cueing level programming. The final, and most difficulty level of programming for a student is telling and writing. At this level, the

teacher tells or has the student read how to learn a new skill or new knowledge.

The key to the programming phase is for the teacher to choose the least intensive of the programming levels that is necessary to have the student successfully complete the required task and to then move thorough subsequent levels until reaching the telling/writing level.

The teacher systematically manages the factors of the Individualizing, Entering Factors and Programming (IEP) phases to complete the Learning phase of the LOAD procedure. The Learning phase continues until the student has reached the goal of the acquisition level of learning - 90 per cent or above accuracy while functioning independently of the teacher's support.

Operation

The second portion of the LOAD procedure is the Operation phase. The Operation phase is analogous to the operating system in a micro-computer. The operating system is designed to control and coordinate the functioning of the various

portions of the computer systems, e.g., diskdrives, printer, etc. The Operation phase of the LOAD procedure is designed to help the LD student coordinate his/her efforts intc becoming more efficient in completing classroom tasks, and in particular to efficiently use what has been acquired in the Learning phase of the LOAD procedure.

The Operation phase emphasizes the development of the student's awareness of the accuracy of his/her performance - an area in LD students are typically weak. There are two strategies which the LOAD procedure employs in the Operation phase. The first of these is the WHALE operating system. The WHALE operating system is used whenever the student is doing a task that requires a careful, systematic approach. In the steps of the WHALE operating system, the student learns to ask these questions.

W - "What am I to do? Do I understand the instructions?"

H - "How am I to do the task? Can I do the step properly?"

A - "Analyze the process. Am I working carefully and getting the right answers?"

L - "Learning - What am I learning?" Check my answers when I finish."

E - "Exit! Did I record my progress? Am I ready to Exit?"

These steps are initially modeled and verbalized by the teacher and then practiced by the student while working on review material until the student has learned to monitor his/her performance.

The second operating system is the WHAMM system. The WHAMM system is employed when the student is doing a review task that requires more speed rather than the careful, systematic WHALE approach. The WHAMM procedure has the student follow these steps.

W - "What am I to do? Do I understand the instructions?"

W - "How am I to do the task? Can I do the steps properly?"

A - "Attack the problems! Work quickly and carefully. Get it done!"

M - "Monitor! Did I do everything correctly? Did I answer all the questions?"

M - "Move on! Check my answers, record my progress and move on!"

The WHALE and WHAMM procedures are designed to help the LD student to be more aware of what he/she is doing and how well he/she is doing is completing the task.

As part of the Operation phase the LD student learns several error messages to communicate to the teacher whenever there is a problem completing the task. Error message 1 indicates, "I don't know what to do." Error message 2 indicates, " I don't know how to do the task." Error message 3 indicates "I don't think I am getting the right answers." Error message 4 indicates "The system is overheating. I need a break."

The final aspect of the Operation phase of the LOAD procedure is for the teacher to make certain that there is sufficient voltage or power to keep the system functioning. Electricity supplies the power for a microcomputer, while an appropriate contingency management program would provide the power for an LD student. During the early stages the teacher might provide the reinforcement, but would gradually move the responsibility for monitoring progress and reinforcing to the student.

Application of the Program

Once the basic programming is completed (the Learning phase) and the parts of the system are ready to operate (the Operation phase) the teacher, just as the programmer, wants the program to run. The phase of Applying, or running, the program is comparable to the proficiency stage of learning. In the Application (i.e., proficiency) phase, the goal of instruction is on speed and fluency of using a skill, as opposed to just accuracy as in the Learning (i.e., acquisition) phase.

The major instructional tactics used in the proficiency stage center around practice, drill and repetition. Likewise, the major activities in the Application phase are to have the student practice and repeat the skill and/or knowledge acquired in the Learning phase. The amount of practice and repetition is determined by the Base Factor Analysis. The Base Factor Analysis is a simple mathematical formula which provides a guideline for the amount of repetition based (1) on the type of task and (2) on the accuracy of the student's performance in the Application phase. The task aredivided into four types of responses and are shown on Table 1 below.

TABLE 1

Guide to the Use of Base Factor Analysis

to Compute Minimum Trials

Activities for Base Factor 3 (70% minimum)

Reconstruction/Application Level

- Spelling words
- Reading Comprehension Skills
- Word Problems in Mathematics

Activities for Base Factor 5 (80% mininum)

Recall Level

- Word Recognition (not Dolch List)
- Math problems involving renaming with two digit numbers (or larger)
- Telling time

Activities for Base Factor 10 (90% minimum)

Recall/Recognition of Fundamental Operations

- Dolch List Sight words
- Number Facts - all operations

Activities for Base Factor 20 (95% minimum)

Rote Recall/Recognition

- Number Names
- Letter Names
- Color Names
- Recognizing Coins

The teacher computes the minimum number of practice trials that a student should have in the Application phase by using this formula: Minimum Trials = Base Factor + (Errors x Base Factor). For example, if a student were practicing spelling words and wrote a word correctly from memory three out of three times, the student would stop practicing at that point because practicing spelling words has a Base Factor of 3 and the Minimum Trials Formula would be 3 Base Factor + (0 errors x 3 Base Factor) = 3 Minimum Trials. If the student missed one of the trial trials on the spelling words, the Minimum Trials Formula would be Base Factor 3 + (1 error x 3 Base Factor) = 6 Trials. This would mean that the student would need to write the spelling word three additional times without error to meet the Minimum Trials Formula.

The minimum number of Trials should be spread over at least two different sessions or repeats to assure mastery. Also, the repetitions should occur with a number of different activities, when possible. For example, a student who is demonstrating mastery of the Dolch word "there" may

read it on flash cards, in context in the reading book and from a list of words on the chalkboard in reaching the minimum trials of 10 without error i.e., Based Factor of 10 for Dolch words with the formula Minimum Trials = Base factor 10 + (0 errors x 10 Base Factor) = 10.

The effect of the Base Factor is two-fold. Because the number of suggested minimum trials could increase astronomically when the student makes errorsbecause it is the product of errors times the Base Factor, the teacher must make certain that the student has mastered a task (Learning phase) prior to having the student practice the task (Application phase). Secondly, if a student does have some problems accurately doing an activity, the Base Factor Analysis provides assurance that the task is truely mastered before the student proceeds.

Data Management

The final phase of the LOAD program is Data Management. The Data Management phase includes preparation of the practice materials, worksheets and classroom environment and evaluation of the results of the student's work in charting and reprogramming.

A data preparation checklist is included in Appendix A, which lists specific considerations that a teacher may want to make regarding modifying worksheets. The items listed on the checklist do not imply whether a particular worksheet modification is necessarily good or bad but just that the teacher should consider whether the modification is appropriate for a given student. For example, the checklist suggests giving "fewer problems per page" as a way to help the student. There are manysituations, however, in which the teacher would appropriately want a student to be able to do more rather than fewer problems per page in an effort to increase on-task behavior or in preparation for returning to the regular class.

The checklist is divided into three sections: format factors, setting factors and task factors. The setting factors are those related to the manner in which activities are presented to the student. This section includes possible modifications in the instruction, types of tasks, shifts in the tasks, repetition and response considerations. The setting factors include environmental considerations such as

grouping, distractions and necessary materials. Task factors deal with the actual behaviors needed to complete the tasks and whether prerequisite skills have been developed.

While the teacher would have the major responsibility for data preparation activities by using items from the checklist, the student might be involved in the data evaluation part of Data Management. In particular, the student might be assigned the responsibility of checking the completedwork and of charting the accuracy and possibly speed of completing the work. The teacher and student together would review the progress and decide what, if anything needs to be done regarding returning to the Learning phase for additional acquisition activities or returning to the Application phase for more practice and drill at the proficiency level. The teacher would ask the student to indicate which activities seemed to be the most helpful, which parts of the task the studentunderstood and on which the student feels a need for more help.

Considerations for Using The Load Procecure

As the teacher and student continue to use the LOAD procedure certain of the phases would be shifted from teacher control to student control. The Operation phase would be the first to come under student control because this phase is based on developing the student's awareness of what is to be done and how to do it. The Individualizing portion of the Learning phase which involves cooperative goal setting and providing information regarding which activities are the most helpful would be the second area in which the student would assume some the responsibility.

The portion of data evaluation dealing with correcting the work and later charting the progress would be the next activities for which a student might take responsibility. Finally, some advanced students might be able to make judgements about how much practice and repetition should be done during the Application phase. The majority of the Learning phase would always remain controlled by the teacher.

While the parallel between a teacher of LD students and a computer programmer is far from

perfect, there is much that the teacher can learn from the programmer in that teaching, like programming, should be systematic and follow certain rules, use student's work results to refine and debug procedures and assume the responsibility of success and failure based on the effectiveness of planning and sequencing the steps of operations. Unlike the programmer, the teacher work with the LD student to assist that student to assume greater responsibility in his/her own programming and ultimate success.

Appendix A

Data Preparation Checklist

I can improve operating efficiency by having:

A. Format Factors

1. Materials that are

____ cleaner

____ more attractive

____ less irrelevant

2. Instruction specify

____ time expectations

____ expected level of success

____ what to do upon finishing

____ 3. Instruction made clearer through:

____ additional visual cues emphasizing (a) symbols, (b) key words, (c) illustrations, (d) a page with a similar format

____ additionally auditory cues provided by (a) reading instructions, (b) taped instructions, (c) verbalized instructions

___ the student verbalizing instructions before starting

4. Work arranged with:

____ task difficulty level constant

____ no shift in type of task

____ fewer problems per page

____ only one step in answering each problem

____ an example of where to respond

____ sufficient space provided to respond

____ a recognition type response

____ a partial reconstruciton response

____ a reconstruction response

5. Immediate feedback

____ in the form of a correct answer

____ in the form of more information to resolve the problem

____ 6. More repetition than the material provides

____ 7. Reviewed preceeding lessons

8. Contingencies for completing work that are

____ clearly stated

____ immediate

____ appropriate

B. Setting Factors

____ 1. Fewer units of work assigned

2. Necessary materials at hand:

____ Instructional aids

____ pencil, paper

3. Fewer extras with which to deal

____ remove extra stuff on desk

____ reduce extras needed to work (acetate sheets, books, instructional aids)

4. External interference reduced:

____ from other students

____ from personal problems

5. Grouped students in:

____ small homogenous groups (discovery)

____ small hetrogeneous groups (didactic - peer tutoring)

C. Task Related Factors

____ A behavioral objective for each activity

____ A list of necessary skills contained in each activity

____ The necessary skills developed in the preceeding lesson. (better sequencing).